

Please cancel Figs. 8, 9, and 10.

Please cancel specification paragraphs 31-34.

Specification Paragraphs 21, 22, and 29 are amended as follows:

[0021] First, the coupling for grooved end pipe, FIGS. 1 to 6, will be explained simultaneously. FIGS. 1 and 2 are the same, except that FIG. 2 shows a reverse view, and it shows the relative position positions of weight and power arms with respect to each other. As shown in FIG. 1, the coupling has body C with outer diameter C1 and inner diameter C2. The depth of the inner groove G1, which is used to accommodate lever jaws J, is depicted by the height between inner diameters C2 of the coupling body and groove diameter 31. The coupling C is shown to engage pipe 14 with inner and outer diameters 20 and 21 respectively. The two ends of lever J are shown by J1 and J2. Concentric with the coupling, an arcuate portion J4, of lever jaw J, is delineated by J2, J6 and J7. J4 is concentric with the coupling body, with the pipe, with the inner groove in the body of the coupling, and with the groove in the outer surface of the pipe. The section between J7 and J9 diverges from said arcuate section J4, by making an interior angle at J7 with J4, outward and away from the center of the coupling to the fulcrum ~~an~~ and integral axle J3 of the lever jaw. The power arm J8 shown in FIGS. 2, 3, 5 and 6 between J3 and J12, exits out of the coupling by making an offset interior angle with the weight arm at J9. The weight arm J5 and the power arm J8 are kept apart by means of circular stem J15 shown in FIG. 3. The power arm J5 preferably is replica of the weight arm J8. The section between of the power arm between J11 and J18 ( shown in FIG. 3) diverges from the arcuate section J8 by making an interior angle at J11 with J8. Lever jaw J is held in position to coupling body C by means of a fulcrum integral axle J3, located in a cut delineated by cut sides 32, 33, and 33 34, where groove G1 is also interrupted. The power arm J8, between J3 and J12, rotates the weight arm from J3 to J2, about the fulcrum J3. The portion of lever jaw J4, between J2 and J6, is designed to engage the groove of the pipe. The groove on the end portion of the pipe is indicated by 22.

[0022] Optional radial bolts may be provided to secure the unlocking of the power arms j8, but the power arms may be locked in place by friction fit against the outer faces F1 and F2 of the coupling body. In low pressure pipes or hoses where frequent engaging and disengaging of the coupling is required, only one lever jaw J will be provided in the coupling. It is further pointed out that if high pressure in the pipe line requires the use of more than one or two lever jaws, then more than one or two lever jaws J will be provided for the coupling. The two pipes being connected in the Figures are shown by 14 and 14A; their outer diameters are depicted by 21 and 21A.

[0029] ~~Now FIGS. 7, 8, and 9 will be discussed together. The~~ In FIG. 7, the diaphragm gasket seal 1, as shown in FIG. 4, is slightly modified by providing inclines 3 and 3A in the outer surface of the diaphragm, rather than in the back of the diaphragm. ~~The diaphragm seal is the same in FIGS. 7 and 8. The coupling in FIG. 7 is provided with at least one lever jaw 7 J (shown in FIGS. previously discussed) on one side of the coupling; the other side of the coupling is provided with preferably a set of four jaws (where two jaws of the set are indicated by 60 and 62 ) held slidably inside the coupling body by means of slants depicted by 60A and 62A of jaws 60 and 62. The incline 3A is extended clearly to the outer face F2 of the coupling body to make it easier to mount the heavier diaphragm seal 1 inside the coupling body, particularly it is needed in the case of small size couplings. Opposite at the center of each of the jaws depicted by 60 and 62, a linear radial opening or slot for the travel of bolts 73 is provided. Each jaw is provided an extension 69 fitted under 15A. The expanding push of the jaws shown by 60 and 62 enlarge the diameter of 15A, and by tightening the bolts 73, the jaws are locked in place with the expanded diameter of said jaws, which further eases the mounting of the pipe 14A. In small size pipes where the diametrical tolerances are tight the mounting of the pipes in the coupling is not much of a problem, but in large size pipes where the range of tolerances are wider, it does create a problem in mounting of the pipe in a cylindrical coupling. Therefore, to overcome this difficulty, the embodiment of FIG. 8 provides a coupling where jaws of type 60 and 62 are provided on both ends of the coupling body. The coupling C provides a cavity 19 in conjunction with pipes 14 and 14A for~~

diaphragm gasket seal 1. The cavity is delineated by inner surfaces 28, 25, 26, 25A and 26A in the coupling body, and end portions of pipes 14 and 14a. Except for the pipes 14 and 14A, gasket 1 is delineated by numbers from 1 to 15. The two ends 2 and 2A of gasket 1 are abutted against two sides 26 and 26A of cavity 19. The end portions of the gasket with the inclines 3 and 3A are depicted by 15 and 15A. Fluid enters the diaphragm gasket seal through the gap G, between the ends 16 and 16A of pipes 14 and 14A, and then reaches inner cavities 13 and 13A through openings 12 and 12A. The fluid simultaneously pressurizes the entire diaphragm seal, including portions 11 between 17 and 18, and portion 11A between 17A and 18A, with 11 and 11A being positioned around 14 and 14A respectively. Thus the exit of the fluid, between pipe 14 and gasket portion 11, and pipe 14A and gasket portion 11A, is blocked. Openings 12 and 12A are located in the section between 6 and 6A, away from the ends 16 and 16A of 14 and 14A. Under fluid pressure, ends 15 and 15A are squeezed by the components of pressure force, and create hydraulic grips, which become complementary force to help lever jaws J to hold the pipes in place. Thus, plain ended pipe can be connected by the coupling of this invention. The interior section between faces 10 and 10A of gasket 1 makes a bell type curve indicated by curves 5, 7 and 5A, where the bell accommodates the designed deflection of the pipe. The length of each of the sections 11 and 11A of the diaphragm, in contact with the pipes, is preferably kept equal to half of the outside radius of the pipe, which is equated against the pressure acting against the shut off valve. At the time of mounting of diaphragm gasket seal 1 around the pipe, the angular section of gasket shown rising from the pipe's surface is some what stretched in its diameter and the rest portion of the diaphragm running toward the end of the coupling body merely hugs the surface of the pipe. Till the diaphragm is pressurized by the fluid, opposite angular portions of the bell section of the gasket nearest to the pipes and ends 15 and 15A of diaphragm 1 block the exit of the fluid from the pipe line.